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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,167	03/19/2001	Gerald George Kiernan	ARC920010026US1	9252

26381 7590 12/08/2003
LACASSE & ASSOCIATES, LLC
1725 DUKE STREET
SUITE 650
ALEXANDRIA, VA 22314

EXAMINER,

PHAM, HUNG Q

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 12/08/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/810,167

Applicant(s)

KIERNAN ET AL.

Examiner

HUNG Q PHAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,10-13,18-22,24,25,31-34 and 39-45 is/are rejected.
- 7) ☒ Claim(s) 2,5-9,14-17,23,26-30,35-38 and 46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-46 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4 and 12-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to claims 4 and 12-13, the claims recite limitation *tagger graph* in wherein said tagger graph.... There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3-4, 10-13, 18-22, 24-25, 31-34 and 39-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandez et al. [USP 6,604,100].

Regarding to claims 1, 22 and 44-45, Fernandez teaches a method, a system, a computer program product for converting relational data to XML. The Fernandez method utilizes SilkRoute to use an existing XML query language, XML-QL, against a relational database (Col. 3, lines 10-24). As shown in FIG. 1, SilkRoute 100 serves as middleware between a relational database server 110, and an application 120. To access the data, the application 120, can formulate a user query in XML-QL over the virtual view and send it to SilkRoute 100. Together, the view query and the user query can be passed to the query composer module 102. The query-composer module computes the composition and produces a new view query, RXL query, called the executable query. The answer to the executable query typically includes only a small

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fragment of the database, e.g., one data item, a small set of data items, or an aggregate value. The result of SilkRoute 100 is an XML document, as specified by the user query (Col. 4, line 64-Col. 5, line 25). As shown in FIG. 2, the query is composed by pattern matcher 140 by evaluating user queries (U) on view query (V) templates (Col. 12, lines 32-45). The view query V may be represented by a data structure called a view tree (Col. 12, lines 60-61) as *a tagger tree graph*. A view tree Node is composed of a tag, a rule, and a list of children nodes. A Rule is composed of a Skolem term as its head, and a conjunctive list of conditions in its body. A Condition is a table expression, a filter expression, or the disjunction of two lists of conjuncts (Col. 21, lines 43-48). As seen, each node of a view tree comprises a rule including a condition such as a table expression, a filter expression, or the disjunction of two lists of conjuncts as *a tagger operator*, and a list of children nodes as *a parse tree*. In other words, the Fernandez technique as discussed indicates the step of *generating a tagger tree graph from said XML query, each node of said tagger tree graph comprising a tagger operator, each tagger operator having a parse tree associated therewith*. Fernandez does not explicitly teach the step of *calling each tagger operator in accordance with a structure of said tagger tree graph, and evaluating said parse trees associated with each called tagger operator to tag results of said XML query over said relational database*. However, as illustrated by Fernandez, a reseller can retrieve all products with a sale price less than half of the retail price using the XML-QL user query (U) below:

```
1.  construct
2.  <results> {
3.      where <supplier>
4.          <company>$company</company>
5.          <product>
```

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```

6.         <name>$name</name>
7.         <retail>$retail</retail>
8.         <sale>$sale</sale>
9.     </product>
10.    </supplier> in "http://acme.com/products.xml",
11.    $sale < 0.5 * $retail
12. construct
13.     <result ID=Result($company)>
14.         <supplier>$company</supplier>
15.         <name>$name</name>
16.     </result>
17. } </results>

```

The where clause includes a pattern (lines 3-10) and a filter (line 11). A pattern's syntax is similar to that of XML data, but also may contain variables, whose names start with \$. Filters are similar to RXL (and SQL). The meaning of a query is as follows. First, all variables in the where clause are bound in all possible ways to the contents of elements in the XML document. For each such binding, the construct clause constructs an XML value. Grouping is expressed by Skolem terms in the construct clause. In this example, the construct clause produces one result element for each value of \$company. Each result element contains the supplier's name and a list of name elements containing the product names. The query composer module 102 takes the user query and the RXL view query and generates a new RXL query, which is equivalent to the user query evaluated on the materialized view.

The RXL view query (V) is constructed as below

```

1. construct
2. <supplier ID=Supp( )>
3.   <company ID=Comp ( )>"Acme Clothing"</company>
4.   {
5.     from Clothing $c
6.     where $c.category = "outerwear"
7.     construct
8.       <product ID=Prod($c.pid)>
9.       <name ID=Name($c.pid,$c.item)>$c.item</name>
10.      <category ID=

```

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```

                Cat($c.pid,$c.category)>$c.category</category>
11.            <descriptionID=
    Desc($c.pid,$c.description)>$c.description</description>
12.            <retail
    ID=Retail($c.pid,$c.price)>$c.price</retail>
13.            { from SalePrice $s
14.                where $s.pid = $c.pid
15.                construct
16.                <sale
    ID=Sale($c.pid,$s.pid,$s.price)>$s.price</retail>
17.            }
18.            { from Problems $p
19.                where $p.pid = $c.pid
20.                construct
21.                <report code=$p.code ID=
    Prob($c.pid,$p.pid,$p.code,$p.comments)>
22.                $p.comments
23.                </report>
24.            }
25.            </product>
26.        }
27. </supplier>

```

And the composed query, RXL query (C) is shown below.

```

construct
  <results>
  { from Clothing $c, SalePrice $s
    where $c.category = "outerwear",
      $c.pid = $s.pid,
      $s.price < 0.5 * $c.retail
    construct
      <result ID=Result("Acme Clothing")>
      <supplier>"Acme Clothing"</supplier>
      <name ID=Name($c.pid, $c.item)>$c.item</name>
    </result>
  }
</results>

```

The composed query combines fragments of the view query and user query. Those fragments from the user query are highlighted. The composed query extracts data from the relational database in the same way as the view query. It also includes the user filter $\$s.price < 0.5 \$c.retail$ and structures the result as in the user query (Col. 5, line 57-Col. 9, line 59). As seen, the filter as tagger operator is called in accordance with the structure

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of the view tree, and obviously, the children nodes in the view tree node as parse tree also is evaluated as specified by the query to tag the results of XML query over the relational database. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the Fernandez method by including the step of evaluating parse tree in order to return the result to XML query.

Regarding to claims 3 and 24, Fernandez teaches all the claimed subject matters as discussed in claims 1 and 22, Fernandez further discloses *tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator* (Col. 20, lines 44-49).

Regarding to claims 4 and 25, Fernandez teaches all the claimed subject matters as discussed in claims 1 and 22, Fernandez further discloses *tagger graph includes a tagger input operator for each level in a result XML tree of said XML query* (Col. 21, lines 43-48).

Regarding to claims 10 and 31, Fernandez teaches all the claimed subject matters as discussed in claims 1 and 22, Fernandez further discloses *each tagger operator implements a next method to produce a result row* (Col. 5, line 57-Col. 9, line 59).

Regarding to claims 11 and 32, Fernandez teaches all the claimed subject matters as discussed in claims 1 and 22, Fernandez further discloses the step of *parsing*

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said XML query; transforming said XML queries into a language-neutral intermediate representation; rewriting said language-neutral intermediate representation into an equivalent form easily translated into an SQL query; translating said equivalent form into one or more SQL queries over said relational database, and executing said one or more SQL queries to produce said results of said XML query over said relational database (Col. 5, line 57-Col. 9, line 59).

Regarding to claims 12 and 33, Fernandez teaches all the claimed subject matters as discussed in claims 11 and 32, Fernandez further discloses *tagger graph is generated from said equivalent form* (Col. 5, line 57-Col. 9, line 59).

Regarding to claims 13 and 34, Fernandez teaches all the claimed subject matters as discussed in claims 11 and 32, Fernandez further discloses *tagger graph includes a tagger input operator for each node in a result XML tree of said XML query* (Col. 5, line 57-Col. 9, line 59).

Regarding to claims 18 and 39, Fernandez teaches all the claimed subject matters as discussed in claims 11 and 32, Fernandez further discloses *tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator* (Col. 20, lines 44-49).

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Regarding to claims 19 and 40, Fernandez teaches all the claimed subject matters as discussed in claims 11 and 32, Fernandez further discloses *a number of relational database tables of said relational database are mapped to a number of virtual XML documents and said XML queries are issued over said virtual XML documents* (Col. 3, line 10-Col. 4, line 61).

Regarding to claims 20 and 41, Fernandez teaches all the claimed subject matters as discussed in claims 1 and 22, Fernandez further discloses *the method operates over a distributed computing network* (FIG. 1).

Regarding to claims 21 and 42, Fernandez teaches all the claimed subject matters as discussed in claims 20 and 41, Fernandez further discloses *the method operates over the Internet* (Col. 4, line 64-Col. 5, line 10).

Regarding to claim 43, Fernandez teaches all the claimed subject matters as discussed in claim 22, Fernandez further discloses *tagger runtime operates outside an RDBMS* (Col. 5, line 57-Col. 9, line 59).

Allowable Subject Matter

6. Claims 2, 5-9, 14-17, 23, 26-30, 35-38 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

The closest available prior arts, USP 6,604,100, issued to Fernandez also teaches a method for tagging results of an XML query. However, as in claims 2, 5-9, 14-17, 23, 26-30, 35-38 and 46, Fernandez fails to teach or suggest *tagger node graph has a top-most tagger operator and a plurality of lower-most tagger operators, said calling and evaluating steps further comprising: a. starting with said top-most tagger operator, each tagger operator implementing a method to request results from inputs to said tagger operator, said method causing lower-level tagger operators connected to said inputs to be called; b. starting with said lower-most tagger operators, each called tagger operator returning intermediate tagged results to a higher-level connected tagger operator upon evaluating said associated parse tree; performing steps a and b until an end of said results of said XML query is reached, and said top-most tagger operator producing tagged output XML of said results of said XML query as in claims 2, 23, 46, tagger input operators execute in a sorted outer union mode, and said translating step produces a single SQL query to produce a single sorted outer union relational database result as in claims 5, 26 and 14, 35*

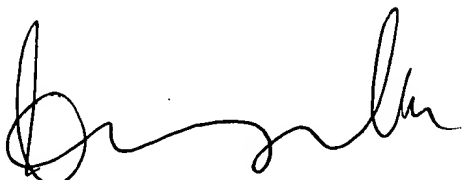
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q PHAM whose telephone number is 703-605-4242. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KIM Y VU can be reached on 703-305-4393. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Examiner Hung Pham
November 25, 2003



KIM VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100